



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 6787**  
Tohru HIRAYAMA et al. : Attorney Docket No. 2002\_0486A  
Serial No. 10/089,882 : Group Art Unit 2121  
Filed April 5, 2002 : Examiner Mila Airapetian  
TONED-PAINT ORDER-GIVING AND : **Mail Stop Amendment**  
ORDER-RECEIVING SYSTEM AND  
AGENT'S SERVER COMPUTER

**SUBMISSION OF VERIFIED ENGLISH TRANSLATIONS**  
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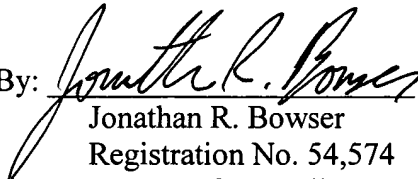
Sir:

Submitted herewith are verified English language translations of Japanese Patent Application No. 2000-238579, filed August 7, 2000, and Japanese Patent Application No. 2000-251616, filed August 22, 2000. The present application claims foreign priority to these two Japanese applications.

Respectfully submitted,

Tohru HIRAYAMA et al.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 6787**  
Tohru HIRAYAMA et al : Docket No. 2002-04864  
Serial No. 10/089,882 : Group Art Unit 3625  
Filed April 5, 2002 : Examiner Mila Airapetian

TONED-PAINT ORDER-GIVING AND  
ORDER-RECEIVING SYSTEM AND AGENT'S  
SERVER COMPUTER

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**TRANSLATOR VERIFICATION**

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Sir:

I, Akiko BUTO, declare and say:

that I am thoroughly conversant in both the Japanese and English languages;

that I am presently residing at Room 301, Ono Bldg., 1-8-5, Botan, Koto-ku,  
Tokyo, Japan;

that the attached document represents a true English translation of the certified  
copy of Japanese Patent Application No. 2000-238579 filed August 7, 2000, which I  
prepared when I was engaged as a translator of Odajima & Co. having the address at  
Nippon Jitensha Bldg., 9-15, Akasaka 1-chome, Minato-ku, Tokyo, Japan.

I further declare that all statements made herein of my own knowledge are true  
and that all statements made on information and belief are believed to be true; and  
further that these statements were made with the knowledge that willful false  
statements and the like so made are punishable by fine or imprisonment, or both,  
under Section 1001 of Title 18 of the United States Code, and that such willful false  
statements may jeopardize the validity of the application or any patent issuing thereon.

Signed this 4th day of November, 2005.

*Akiko Buto*

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Akiko BUTO



(TRANSLATION)

JAPAN PATENT OFFICE

This is to certify that the annexed is a true copy of the following application as filed with this Office.

Date of Application : August 7, 2000

Application Number: Patent Application No. 2000-238579

Applicant(s) : Kansai Paint Co., Ltd.

August 31, 2001

Kozo OIKAWA

Commissioner,  
Japan Patent Office

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[Document Name] Specification

[Title of the Invention] Toned-Paint Order-Giving and Supplying Method

[Claims]

[Claim 1] A toned-paint order-giving and supplying method characterized by  
5 including:

(1) a step of allowing a paint orderer to input the following to a  
computer terminal: a colorimetric data of a reference color with which the color  
of a paint should be matched through toning, the type of the paint and a  
necessary quantity of the paint; to connect the computer terminal to a server  
10 computer of an agent; and to enter a toning job;

(2) a step of allowing the agent to select a toning person and to give  
an order for the toning job to the selected toning person;

(3) a step of allowing the agent to obtain an order-receiving approval  
from the toning person and to transmit an order-receiving decision to a  
15 computer terminal of the paint orderer;

(4) a step of allowing the toning person to prepare a toned paint  
corresponding to the content of the above toning job; and

(5) a step of supplying the above toned paint to the paint orderer.

[Claim 2] The method according to Claim 1, characterized that a paint orderer  
20 is a repair painter.

[Claim 3] The method according to Claim 1 or 2, characterized in that a toning  
class is further input to the computer terminal in the above step (1).

[Claim 4] The method according to any one of Claims 1 to 3, characterized by  
retrieving delivery states between toning persons and a paint orderer, and the  
order backlog of the toning persons by a computer system about a plurality of  
25 toning persons; selecting a toning person in accordance with the retrieval  
content; and giving an order for a toning job to the selected toning person in the  
above step (2).

[Claim 5] The method according to any one of Claims 1 to 3, characterized by  
30 opening a toning job to a plurality of toning persons by a computer system,  
accepting tenders by the computer system, and selecting a toning person in  
accordance with a tender result in the above step (2).

[Claim 6] The method according to any one of Claims 1 to 5, characterized by

determining whether a measured value of the color of a toned paint plate is present in a color-end-point allowable range when preparing a toned paint, and completing toning when the measured value is present in the color-end-point allowable range in step (4).

- 5 [Claim 7] The method according to any one of Claims 1 to 6, characterized by the following: it further includes (1a) a step in which an agent estimates an allowable limit of toning by a designated type of paint through the computer toning using a color-matching computation logic about the content of a toning job, and when it is difficult to prepare a toned paint through the toning job, the  
10 agent transmits the data of the allowable limit of toning by the designated type of paint to a computer terminal of a paint orderer, and receives the approval of change to a toning job within the allowable limit of toning from the paint orderer, after the above step (1); and the agent selects a toning person and gives an order for the change-approved toning job to the selected toning person, in the  
15 above step (2).

[Claim 8] The method according to Claim 7, characterized by transmitting the computer toning data estimating an allowable limit of toning by a designated type of paint to the selected toning person when giving an order for a change-approved toning job to the selected toning person in the above step (2).

- 20 [Claim 9] The method according to any one of Claims 1 to 8, further including (6) a step in which a painter prepares a test paint plate by test-painting the plate with the said toned paint supplied by the above step (5), obtains the colorimetric data of the test paint plate, compares the colorimetric data of the test paint plate with a reference color by a computer, and determines whether the criterion of  
25 the toning end point is satisfied.

- [Claim 10] The method according to Claim 9, characterized by repeating step (7) of the following: displaying painting conditions which may satisfy the criterion of the toning end point by the above computer; allowing a painter to prepare a test paint plate again by test-painting the plate with a toned paint in the same  
30 step as the above step (6) under the said painting conditions, to compare the colorimetric data of the said test paint plate with a reference color by the computer, and to determine whether the criterion of the toning end point is satisfied; until the criterion of the toning end point is satisfied when it is not

satisfied in the above step (6).

[Claim 11] The method according to Claim 9 or 10, further including (8) a step of allowing a computer to compare the colorimetric data of a test paint plate with a reference color and to determine that the criterion of the toning end point is  
 5 satisfied, and then, allowing a painter to perform full-scale painting.

[Claim 12] A toned-paint order-giving and order-receiving method characterized by including:

(1) a step of allowing a paint orderer to input the following to a computer terminal: the colorimetric data of a reference color with which the  
 10 color of a paint should be matched through toning, the type of the paint and a necessary quantity of the paint; to connect the computer terminal to a server computer of an agent; and to enter a toning job;

(2) a step of allowing the agent to select a toning person and to give an order for a toning job to the selected toning person; and

15 (3) a step of allowing the agent to obtain an order-receiving approval from the toning person and to transmit an order-receiving decision to a computer terminal of the paint orderer.

[Claim 13] A toned-paint order-giving and order-receiving system including:

(a) a paint-orderer's computer terminal in which a toning job  
 20 including the information about the following is input: the colorimetric data of a reference color with which the color of a paint should be matched through toning, the type of the paint and a necessary quantity of the paint;

(b) an agent's server computer in which the said toning job sent from the paint-orderer's computer terminal is entered, an order for the toning job is  
 25 given to a toning person selected out of toning-person data, and the order-receiving decision of the toning person is transmitted to the paint-orderer's computer terminal; and

(c) a toning-person's computer terminal for transmitting the order-receiving approval of the toning person about the said toning job to the  
 30 agent's server computer; and characterized in that the computer terminal (a), the server computer (b) and the computer terminal (c) are connected each other by a communication line.

[Claim 14] An agent's server computer characterized by the following: a toning

job sent from a paint orderer including the information about the colorimetric data of a reference color with which the color of a paint should be matched through toning, the type of the paint and a necessary quantity of the paint is entered; a toning person is selected out of toning-person data including order  
5 backlogs of a plurality of toning persons and delivery states from a toning place up to a painting place of the paint orderer; an order for the said entered toning job is given to a computer terminal of the selected toning person; and moreover, the order-receiving approval of the toning person about the order-given toning job is received; and an order-receiving decision is transmitted to a computer  
10 terminal of the paint orderer.

[Detailed Description of the Invention]

[0001]

[Technical field to which the invention belongs]

The present invention relates to a toned-paint order-giving and  
15 supplying method and a toned-paint order-giving and order-receiving method to be executed through a computer, a toned-paint order-giving and order-receiving system used for this method, and a server computer used for this system.

[0002]

20 [Prior art and its problem]

Conventionally, when performing repair painting of a perfectly-finished paint film such as an automobile paint film, a toned paint has been prepared in a painting site such as an automobile repair-painting factory and provided for repair painting in general. Therefore, in the painting site, it has  
25 been necessary to keep primary-color paints for toning and manage stocks, secure expert toning persons, and set a computer toning system. Moreover, there have been problems that even if the computer toning system is set, paint attaches to the painting site and the painting site is easily contaminated, and if cleaning is insufficient, computer toning cannot be accurately performed.

30 [0003]

Moreover, when a painter (paint orderer) has given an order for a toned paint to a toning person, because it has been necessary to send a reference plate for toning a color from the painter to the toning person, there



have been problems of time loss and transport cost, and therefore, a quick paint-order-giving method advantageous in cost has been requested.

[0004]

5 An object of the present invention is to provide a quick and cost-advantageous toned-paint order-giving and supplying method capable of separating a toning operation from a repair-painting site, eliminating the toning operation from the painting site, separately obtaining a toned paint, and providing the paint for painting. Another object of the present invention is to eliminate the toning operation from the repair-painting site and solve the above  
10 problems on toning.

[0005]

[Means to solve the problems]

The present inventors found that the above objects can be achieved by the fact that a paint orderer (painter) enters and gives an order for a toning  
15 job through a server computer of an agent, and a toning person receiving the order for the toning job prepares and supplies a toned paint, and thus, they completed the present invention.

[0006]

20 That is, the present invention provides a toned-paint order-giving and supplying method including:

(1) a step of allowing a paint orderer to input the following to a computer terminal: the colorimetric data of a reference color with which the color of a paint should be matched through toning, the type of the paint and a necessary quantity of the paint; to connect the computer terminal to a server  
25 computer of an agent; and to enter a toning job;

(2) a step of allowing the agent to select a toning person and to give an order for the toning job to the selected toning person;

(3) a step of allowing the agent to obtain an order-receiving approval from the toning person and to transmit an order-receiving decision to a  
30 computer terminal of the paint orderer;

(4) a step of allowing the toning person to prepare a toned paint corresponding to the content of the above toning job; and

(5) a step of supplying the above toned paint to the paint orderer.

[0007]

Moreover, the present invention provides the above toned-paint order-giving and supplying method characterized by the following: it further includes (1a) a step in which an agent estimates an allowable limit of toning by a designated type of paint through the computer toning using a color-matching computation logic about the content of a toning job, and when it is difficult to prepare a toned paint through the toning job, the agent transmits the data of the allowable limit of toning by the designated type of paint to a computer terminal of a paint orderer and receives the approval of change to the toning job within the allowable limit of toning from the paint orderer, after the above step (1); and the agent selects a toning person and gives an order for the change-approved toning job to the selected toning person, in the above step (2).

[0008]

Furthermore, the present invention provides the above toned-paint order-giving and supplying method further including (6) a step in which a painter prepares a test paint plate by test-painting the plate with the toned paint supplied by the above step (5), obtains the colorimetric data of the test paint plate, compares the colorimetric data of the test paint plate with a reference color by a computer, and determines whether the criterion of the toning end point is satisfied.

[0009]

The present invention also provides the above order-giving and supplying method characterized by repeating step (7) of the following: displaying painting conditions which may satisfy the criterion of the toning end point by the above computer; allowing a painter to prepare a retest paint plate by test-painting a toned paint in the same step as the above step (6) under the said painting conditions, to compare the colorimetric data of the retest paint plate with a reference color, and to determine whether the criterion of the toning end point is satisfied; until the criterion of the toning end point is satisfied when the criterion of the toning end point is not satisfied in the above step (6).

[0010]

Furthermore, the present invention provides the above order-giving and supplying method characterized by the following: a computer compares the

colorimetric data of a test paint plate with a reference color and determines that the criterion of the toning end point is satisfied, and then, a painter performs full-scale painting.

[0011]

5                   Moreover, the present invention provides a toned-paint order-giving and order-receiving method including:

- (1) a step of allowing a paint orderer to input the following to a computer terminal: the colorimetric data of a reference color with which the color of a paint should be matched through toning, the type of the paint and a  
10   necessary quantity of the paint; to connect the computer terminal to a server computer of an agent; and to enter a toning job;
- (2) a step of allowing the agent to select a toning person and to give an order for the toning job to the selected toning person; and
- (3) a step of allowing the agent to obtain an order-receiving approval  
15   from the toning person and to transmit an order-receiving decision to a computer terminal of the paint orderer.

[0012]

The present invention further provides a toned-paint order-giving and order-receiving system including:

- (a) a paint-orderer's computer terminal in which a toning job  
20   including the information about the following is input: the colorimetric data of a reference color with which the color of a paint should be matched through toning, the type of the paint and a necessary quantity of the paint;
- (b) an agent's server computer in which the toning job sent from the  
25   paint-orderer's computer terminal is entered, an order for the said toning job is given to a toning person selected out of toning-person data, and the order-receiving decision of the toning person is transmitted to the paint-orderer's computer terminal; and
- (c) a toning person's computer terminal for transmitting the  
30   order-receiving approval of the toning person about the said toning job to the agent's server computer; and characterized in that the computer terminal (a), the server computer (b) and the computer terminal (c) are connected each other by a communication line.

[0013]

Furthermore, the present invention provides an agent's server computer characterized by the following: a toning job from a paint orderer including the information about the colorimetric data of a reference color with  
5 which the color of a paint should be matched through toning, the type of the paint, and a necessary quantity of the paint is entered; a toning person is selected out of the toning person data including order backlogs of a plurality of toning persons and a distribution state from a toning place up to the painting place of the paint orderer; an order for the entered toning job is given to the  
10 selected toning person through the toning person's computer terminal; and moreover, the toning person's order-receiving approval about the ordered toning job is received; and an order-receiving decision is transmitted to a computer terminal of the paint orderer.

[0014]

15 [Mode for carrying out the invention]

A toned-paint order-giving and supplying method of the present invention includes the first invention method and the second invention method. First, the first invention method is described below.

The first invention method includes the following steps (1) to (5).

20 [0015]

Step (1)

Step (1) is a step of allowing a paint orderer such as a repair painter to do the following: to input the colorimetric data of a reference color with which the color of a paint should be matched through toning, the type of the paint, a  
25 necessary quantity of the paint, and if necessary, the date of delivery, gloss of a paint film, micro- brilliant-feeling data, and a toning class to a computer terminal; to connect the computer terminal to a server computer of an agent; and to enter a toning job.

[0016]

30 In the case of repair paintings such as automobile repair paintings, when forming a paint film by painting a toned paint, it is necessary that the difference between colors of the paint film of a repair painting portion and the paint film nearby the repair painting portion cannot be easily visually observed.

Therefore, it is usually preferable that the above reference color is the color of the surface of a paint film nearby the repair painting portion.

[0017]

It is allowed that the colorimetric data of a reference color is the data measured by a colorimeter that performs measurement at one angle. However, it is more preferable to use the data measured by a multi-angle colorimeter because it is possible to obtain higher-accuracy data.

[0018]

A paint color is measured by a multi-angle colorimeter under two or more angular conditions, that is, different incident angles of measuring light or different light-receiving angles each of which is an angle formed between a mirror reflection axis and a light-receiving axis. The mirror reflection axis is an axis for forming a reflection angle when an incident angle is equal to the reflection angle such as an axis having a reflection angle of  $45^\circ$  when an incident angle is equal to  $45^\circ$ .

[0019]

To change light-receiving angles, the angular conditions are not restricted. However, the following angular conditions are preferable because it is possible to easily correspond to visual determination of a color: in the case of two angular conditions, the above light-receiving angles must be equal to one angle in the range between  $15^\circ$  and  $30^\circ$  and one angle in a range between  $75^\circ$  and  $110^\circ$ ; in the case of three angular conditions, the above light-receiving angles must be equal to one angle in a range between  $15^\circ$  and  $30^\circ$ , one angle in a range between  $35^\circ$  and  $60^\circ$ , and one angle in a range between  $75^\circ$  and  $110^\circ$ ; and in the case of four angular conditions, the above light-receiving angles must be equal to one angle in a range between  $15^\circ$  and  $30^\circ$ , one angle in a range between  $35^\circ$  and  $60^\circ$ , one angle in a range between  $70^\circ$  and  $80^\circ$ , and one angle in a range between  $90^\circ$  and  $110^\circ$ .

[0020]

It is allowed that measured values (angular criterion measured values) obtained by measuring the above reference color under various angular conditions are any values as long as the values can specify a color, that is, the values can show or compute lightness, chroma, and hue. For example, the

values can be shown by the XYZ color system (X, Y, and Z), the  $L^*a^*b^*$  color system ( $L^*$ ,  $a^*$ , and  $b^*$  values), Hunter Lab color system (L, a, and b values),  $L^*C^*h$  color system ( $L^*$  value,  $C^*$  value, and  $h$  value) specified in the CIE (1994), or Munsell color system (H, V, and C). Above all, the display according to the  
5  $L^*a^*b^*$  color system or  $L^*C^*h$  color system is generally used for the color display in industrial fields including the automobile repair painting field.

[0021]

The gloss of a paint film input according to necessity, which is described previously, is measured according to necessity when it is a frosting  
10 paint film, which shows the specular gloss specified in JIS K-5400 7.6 (1990) and can be measured by a glossimeter at various light reflection angles.

[0022]

The micro-brilliant-feeling data input according to necessity, which is also described previously, is input according to necessity in the case of the  
15 color of a paint having a brilliant feeling and containing a brilliant material: a brilliant pigment having a glittering feeling and an interference action such as scaly aluminum powder, deposited aluminum powder, colored aluminum powder, mica-like iron oxide, mica powder, metal-oxide-covered mica powder, metal-oxide-covered silica flake or brilliant graphite; or metallic powder such as  
20 copper pigment. The micro-brilliant feeling denotes a specific brilliant texture revealed in the color of a paint containing a brilliant material such as aluminum powder or brilliant mica powder.

[0023]

It is possible to measure the micro-brilliant-feeling data by, for  
25 example, a micro-brilliant-feeling measuring instrument, and moreover, compare micro-brilliant-feeling sample-color tags with a reference color, select a color tag having a very-similar micro-brilliant feeling, and obtain the micro-brilliant-feeling data of a purposed paint film from the color tag. The micro-brilliant-feeling sample-color tags can be sample-color tags in which color tags  
30 are systematically arranged in the paints. The color tags are obtained by the following: brilliant-material-containing paints are prepared by changing qualities, particle diameters and blending quantities of brilliant materials and by blending the materials; the brilliant-material-containing paints thus obtained are applied

to a substrate; and the substrate are dried.

[0024]

As specific examples of the micro-brilliant-feeling sample-color tags, it is possible to use a booklet and cards showing paint colors of domestic and foreign automobiles classified every fiscal year and automobile maker.

[0025]

Because micro-brilliant-feeling data, color numbers, or color names are entered in micro-brilliant-feeling sample-color tags, it is possible to extract micro-brilliant-feeling data from the color numbers or color names. Various types of micro-brilliant-feeling data are considered. The present inventors described in the specification of Japanese Patent Application No. 28414/2000 that micro-brilliant feelings were well matched each other when two micro-brilliant-feeling parameters such as a parameter "MGR" showing particle feeling (perception emitted from irregular non-oriented pattern [random pattern] caused by orientation and overlap of brilliant pigments in paint film) and a parameter "MBV" obtained by digitizing a glittering feeling (perception of irregular fine brightness caused by light regularly-reflected from brilliant pigments in paint film) coincided with each other. Although it is not restricted, these parameters can be preferably used as micro-brilliant-feeling data.

[0026]

The above toning class input according to necessity decides a matching degree of a toned-paint color to a reference color (allowable range), and it is possible to change prices of a toned paint in accordance with a toning class. A toning class can be, for example, a color difference between the colorimetric data of a reference color and the paint-color data of a toned paint plate formed by a toned paint.

[0027]

A paint orderer inputs the colorimetric data of the above reference color, the type and a necessary quantity of a toned paint, and if necessary, the date of delivery, gloss of a paint film, micro-brilliant-feeling data and a toning class to a computer terminal, connects the terminal to a server computer of an agent, and enters a toning job.

[0028]

Before entering the toning job, the paint orderer estimates an allowable limit of toning by a designated type of paint through the computer toning using a color-matching computation logic about the colorimetric data of the above reference color. When it may be difficult to prepare a purposed  
5    toned paint by the designated type of paint, it is possible to change the colorimetric data of the above reference color in the toning job to data within the allowable limit of toning by the designated type of paint. The computer toning using the above color-matching computation logic can be performed by using a  
10   computer toning function installed in the computer of the paint orderer, and moreover, it is possible to use the computer toning function by connecting the computer to the server computer of the agent.

[0029]

Step (2)

15           Step (2) is a step of allowing an agent to select a toning person and to give an order for a toning job to the selected toning person. Before giving the order to the toning person, the agent checks in the above step (1) whether an error is present in the toning job sent from a paint orderer according to necessity. When an error is present, the agent communicates the error to the  
20   paint orderer to obtain a correct toning job. When occasion demands, the agent can decline the toning job.

[0030]

For an agent to select a toning person, it is possible to use either of the methods described in the following items (a) and (b).

25           (a) A method of retrieving delivery states between a plurality of toning persons and a paint orderer and order backlogs of the toning persons by a computer system and selecting a toning person in accordance with the retrieval contents. The data of the above delivery states and order backlogs is updated at any time or regularly whenever the data is changed.

30           (b) A method of opening a toning job to a plurality of toning persons by a computer system, accepting tenders by the computer system, and selecting a toning person in accordance with a tender result.



[0031]

An order for a toning job is given to the toning person selected as described above by appending the data of an allowable limit of toning by and blending of a designate type of a paint through the computer toning using the colorimetric data of a reference color, the type and a necessary quantity of the paint, and if necessary, a toning class, date of delivery, and color-matching computation logic according to necessity.

[0032]

A method for giving an order for a toning job is not restricted. However, it is preferable to give the order by connecting a server computer of an agent to a computer terminal of a toning person. In the case of the above method (a), it is normally necessary to append the above data to give an order for a toning job. In the case of the above method (b), when the above data is opened to the public together with a toning job by a computer system, it is allowed to omit the appendance of the colorimetric data of the above reference color.

[0033]

#### Step (3)

Step (3) is a step of allowing an agent to obtain an order-receiving approval from a toning person and to transmit an order-receiving decision to a computer terminal of a paint orderer. Though a method for an agent to obtain an order-receiving approval from a toning person is not restricted, it is preferable to obtain the approval by connecting a computer terminal of the toning person to a server computer of the agent.

[0034]

When the agent cannot obtain the order-receiving approval from the toning person, it is possible to negotiate order-receiving conditions with the toning person or select other toning person in the above step (2).

[0035]

#### Step (4)

Step (4) is a step of allowing a toning person to prepare a toned paint corresponding to the content of the above toning job whose order receiving is approved. It is possible to prepare the toned paint in accordance

with the conventionally-publicly-known paint toning method.

[0036]

To prepare the toned paint, by previously deciding a toning-end-point allowable range in accordance with a toning class or the like, it is possible to display that a computer toning system is present at the toning end point when the measured value of a toned paint plate comes into a toning-end-point allowable range.

[0037]

Moreover, it is preferable to obtain the following: the colorimetric data of a toned paint plate painted with a final toned paint prepared for toning; painting conditions when preparing the toned paint plate; and if necessary, the gloss of a paint film and micro-brilliant-feeling data.

[0038]

Step (5)

Step (5) is a step of supplying the toned paint obtained in the above step (4) to a paint orderer. When supplying the toned paint to the paint orderer, it is preferable to append not only the toned paint but also the data of the colorimetric data of a toned paint plate painted with a final toned paint, painting conditions when preparing the toned paint plate, the gloss of a paint film, micro-brilliant-feeling data, MSDS according to paint blending, and safety indication, according to necessity. To supply the toned paint to the paint orderer, it is possible to preferably use a home delivery service of packages.

[0039]

Then, the second invention method is described below.

The second invention method is a method including the change of toning jobs when it is difficult to prepare a toned paint according to a toning job in step (1) of the first invention method. The second invention method is the same as the first invention method except that the following step (1a) is included after step (1) and a toning job whose order is given to a selected toning person in step (2) is used as the change-approved toning job in the following step (1a). When the change of the toning job cannot be approved, it is possible to decline the toning job. The second invention method is performed when an allowable limit of toning by a designated type of paint is not

previously estimated in step (1) about the colorimetric data of a reference color through the computer toning using a color-matching computation logic.

[0040]

Step (1a)

5           Step (1a) is a step of allowing an agent to estimate an allowable limit of toning by a designated type of paint through the computer toning using a color-matching computation logic, to transmit the data of an allowable limit of toning by the specified type of the paint to a computer terminal of a paint orderer when it is difficult to prepare a toned paint by a toning job, and to  
10 receive the approval of change to a toning job within the allowable limit of toning from the paint orderer. Before applying computer toning about the content of the toning job, the agent checks in step (1) whether an error is present in the toning job sent from the paint orderer according to necessity. When an error is present, it is possible to communicate the error to the paint orderer and obtain a  
15 correct toning job.

[0041]

In the case of the second invention method, an agent selects a toning person in step (2) after the above step (1a) and gives an order for a toning job whose change is approved in the above step (1a) to the selected  
20 toning person. This order giving can be performed by a computer system after connecting a server computer of the agent with a computer terminal of the selected toning person. To perform the order giving, it is possible to transmit the computer toning data estimating the above allowable limit of toning to the toning person.

25 [0042]

The second invention method includes the same steps as steps (3), (4) and (5) of the above first invention method after the above step (2).

[0043]

The above first and second invention methods can include the  
30 following step (6) after step (5).

[0044]

Step (6)

Step (6) is a step of determining the toned paint supplied by the

above step (5). That is, step (6) is a step of allowing a painter (usually, a paint orderer or a person to whom painting is requested from the paint orderer) to prepare a test paint plate painted by test-painting the plate with the supplied toned paint, to obtain the colorimetric data of the test paint plate, to compare the colorimetric data of the test paint plate with a reference color by a computer, and to determine whether the criterion of the toning end point is satisfied. The test painting simulates full-scale painting, and it is necessary that the test painting can reproduce a paint color in the full-scale painting. Painting conditions for the test painting are not restricted, but it is preferable that the painting conditions can be the standard painting conditions for painting with the paint and are conditions same as the painting conditions used to prepare the toned paint in the above step (4).

[0045]

Moreover, the colorimetric data of a reference color used to determine whether the criterion of a test-painting-plate toning end point is satisfied, is the colorimetric data of the reference color in a toning job. For the above determination, it is also possible to use the data obtained by measuring a reference plate again for convenience' sake. The colorimetric data of a test paint plate is compared with a reference color by a computer to determine whether the criterion of the toning end point is satisfied. In this case, the criterion can be the criterion of the toning end point agreed between a paint orderer and a toning person.

[0046]

When the determination result in the above step (6) does not satisfy the criterion of the toning end point, the following step (7) is executed. However, it is impossible to satisfy the criterion of the toning end point even by step (7), it is possible to make a toning person perform re-toning.

[0047]

#### Step (7)

Step (7) is a step of allowing a computer to display painting conditions for satisfying the criterion of the toning end point and allowing a painter (usually, a paint orderer or a person to whom painting is requested from the paint orderer) to prepare a retest paint plate by test-painting the plate with a

toned paint in the same step as the above step (6) under the painting conditions, to compare the colorimetric data of the retest paint plate with a reference color by the computer, and to determine whether the criterion of the toning end point is satisfied. When a determination result does not satisfy the criterion of the toning end point in step (7), it is possible to repeatedly execute step (7) until the criterion is satisfied. Moreover, when it is impossible to satisfy the criterion of the toning end point even by step (7), it is possible to make a toning person perform toning again.

[0048]

Painting conditions for satisfying the above criterion of the toning end point are conditions such as a dilution ratio (painting viscosity) by a solvent, a spray air pressure for spray painting, the distance between a nozzle of a spray gun and a painted material, an attached quantity of a paint, and setting time after painting, which can be obtained in accordance with the data for change of paint colors due to the fluctuation in painting conditions of the above toned paint. Moreover, the above painting conditions can be obtained in accordance with the data for change of paint colors due to the fluctuation of the same type of paints of similar colors having been accumulated so far.

[0049]

In the case of the first and second invention methods, it is also possible to perform full-scale painting after step (5). However, it is preferable to perform full-scale painting under predetermined painting conditions after it is determined that the criterion of the toning end point is satisfied in the above step (6) or (7).

[0050]

A toned-paint order-giving and order-receiving method of the present invention is a toned-paint order-giving and order-receiving method having steps (1) to (3) of the above first and second invention methods.

[0051]

A toned-paint order-giving and order-receiving system of the present invention is a system which can be used to execute steps (1) to (3) of the above first and second invention methods and the above order-giving and order-receiving method.

[0052]

A toned-paint order-giving and order-receiving system of the present invention is an order-giving and order-receiving system including:

- (a) a paint-orderer's computer terminal in which a toning job including the following is input: the colorimetric data of a reference color with which the color of a paint should be matched through toning, the type and a necessary quantity of the paint, and if necessary, the date of delivery, gloss of a paint film, micro- brilliant-feeling data and toning class;
- (b) an agent's server computer in which the toning job sent from the paint-orderer's computer terminal is entered, an order for the toning job is given to a toning person selected out of toning-person data, and an order-receiving decision in accordance with the following order-receiving approval of the toning person is transmitted to the paint-orderer's computer terminal; and
- (c) a toning-person's computer terminal for transmitting the order-receiving approval of the toning person about the toning job to the agent's server computer; characterized in that the computer terminal (a), the server computer (b) and the computer terminal (c) are connected each other by a communication line.

[0053]

- It is allowed that a computer toning function using a color-matching computation logic is provided for the above server computer (b). It is possible to determine whether purposed toning can be made by a designated type of paint so as to match the colorimetric data of a reference color sent as a toning job by the computer toning, and also possible to obtain the data of an allowable limit of toning by the designated type of paint. When purposed toning cannot be made by designated type of paint, it is possible to transmit the data of an allowable limit of toning by the designated type of paint to a paint orderer's computer terminal from an agent and accept the approval of change to a toning job within the allowable limit of toning. When occasion demands, it is possible to change types of paints or cancel a toning job.

[0054]

A toning job sent from a paint orderer including the information of the colorimetric data of a reference color with which the color of a paint should be

matched through toning, the type of the paint, and a necessary quantity of the paint is entered in an agent's server computer of the present invention, and a toning person out of the toning-person data, including order backlogs of a plurality of toning person and delivery states from a toning place up to a painting place of a paint orderer and regularly updated, is selected. The server computer can give an order for the entered toning job to a computer terminal of the selected toning person, and moreover, receive the order-receiving approval of the toning person about the order-given toning job, and transmit an order-receiving decision to a computer terminal of the paint orderer.

10 [0055]

Moreover, it is allowed that a computer toning function using a color-matching computation logic is provided for the server computer. By having the computer toning function using the color-matching computation logic in the server computer, it is possible to have the same function as the case of which the server computer (b) has the computer toning function, in the above toned-paint order-giving and order-receiving method.

15 [0056]

[Examples]

The present invention is more specifically described below by referring to examples. However, it is not restricted to these examples.

20 [0057]

Fig. 1 to be mentioned later is a schematic illustration showing a toned-paint order-giving and supplying method of the present invention. An example of the toned-paint order-giving and supplying method of the present invention is described below by referring to Fig. 1.

In Fig. 1, the colorimetric data (colorimetric data of reference color) obtained by measuring the color of an actual automobile to be repair-painted and the type and a necessary quantity of a paint to be applied are input to computer terminals of a plurality of users (A, B, C, and so on) who are paint orderers, and the computer terminals are connected to a server computer (center server) of an agent to enter a toning job.

30 [0058]

A plurality of paint blendings, color data values and

micro-brilliant-feeling data values corresponding to the paint blendings, and color characteristic data values and micro-brilliant-feeling characteristic data values of a plurality of primary-color paints are entered in the sever computer, and the sever computer has a computer-toning function in which a color-matching computation logic using these paint blendings and the data values works.

[0059]

An operator of the agent's server computer checks whether an error is present in the entered toning job and confirms that there is no error. When an error is present, the operator communicates the error to a paint orderer and corrects the toning job including the error. After error checking, according to necessity, the operator obtains the data of an allowable limit of toning by a designated type of paint from the actual-automobile colorimetric data of the toning job in accordance with a computer-toning function using a color-matching computation logic built in the server computer.

[0060]

Then, the operator selects each toning person about each toning job out of the toning persons input to the server computer and gives an order for each toning job to each selected toning person. In this case, because delivery states between toning persons and a paint orderer and order backlogs of toning persons are input to the server computer, it is possible to select toning persons in accordance with results of retrieving them. When giving an order for a toning job, it is possible to append the data of an allowable limit of toning by a designated type of paint and the blending data of the paint obtained from the computer-toning function according to necessity, in addition to the contents of the above toning job.

[0061]

When a toning person to whom an order for a toning job is given receives the order, the person transmits an order-receiving approval to the server computer. When the person does not receive the order, the person transmits that the order is not received to the server computer. When receiving that the order is not received, an agent selects another toning person. The agent receiving an order-receiving approval by the server computer from



the selected toning person transmits the toning person who decides order receiving to a computer terminal of the paint orderer.

It is possible to give and receive an order for a toned paint in accordance with the steps up to the above-described stage.

5 [0062]

The toning person receiving the order prepares a toned paint corresponding to the content of the toning job and supplies the prepared toned paint to the paint orderer by a home delivery service of packages or the like.

[0063]

10 The paint orderer serves as a painter or asks a painter to examine whether the color of the obtained toned paint matches with a reference color (confirmation painting). After confirming that the color matches with the reference color, the paint orderer paints an actual automobile with the toned paint.

15 [0064]

Fig. 2 is an illustration showing a flow of operations to be performed by a paint orderer in step (1).

The paint orderer measures the reference color around a repair painting portion of an automobile to be repair-painted, inputs a toning job including the type and a necessary quantity of a paint to be applied, and if  
20 necessary, the gloss of a paint film, micro-brilliant-feeling data, a toning class, and the date of delivery to a computer of the paint orderer with the measured colorimetric data, and enters the toning job in a center server of an agent by connecting the computer to the center server through a line.

25 [0065]

Fig. 3 is an illustration showing a flow of operations to be performed by an agent (center server) in step (2).

The center server checks an entered toning job for errors and then selects a toning person. To select a toning person, it is possible to use the  
30 following method: a method of selecting a toning person in accordance with a delivery state between the toning person and a paint orderer, order backlog of the toning person, toning class, and date of delivery (method 1); or a method of opening a toning job to a plurality of toning persons, tendering for the toning job

by a computer system, and selecting a toning person in accordance with the tendering result (method 2). The center server selects a toning person, obtains an order-receiving approval from the selected toning person through a network line, and then transmits an order-receiving decision to a computer terminal of the paint orderer through a network line. When transmitting the order-receiving decision, it is possible to communicate the toning person to the paint orderer.

[0066]

Fig. 4 shows a flow of operations to be performed by a toning person who approves reception of an order for a toning job.

The toning person prepares a toned paint corresponding to the content of a received toning job and prepares a toned paint plate. Then, the toning person determines the color of the prepared toned paint plate and prepares a toned paint until a measured values of the toned paint plate comes into a toning-end-point allowable range predetermined in accordance with a toning class or the like. The toning-end-point allowable range can be controlled in accordance with a numerical value appended to the toning job. The toning person can determine acceptance or rejection in accordance with whether the measured value is present in the toning-end-point allowable range. It is also possible to determine acceptance or rejection by making a computer display the toning end point when the measured value of the toned paint plate comes into the toning-end-point allowable range. A toned paint accepted through color determination is sent to a paint orderer by a home delivery service of packages or the like together with the colorimetric data and micro-brilliant-feeling data of a final toned paint plate, painting condition data for toning, paint safety information (MSDS), and the final toned paint plate.

[0067]

Fig. 5 is an illustration showing a flow of operations to be performed by a painter (usually, a paint orderer or a person to whom painting is requested from the paint orderer) when examining a toned paint supplied from a toning person according to necessity, in a toned-paint order-giving and supplying method of the present invention.

The painter normally prepares a test paint plate by painting the plate

with the supplied toned paint under painting conditions appended to the toned paint by a toned person, compares the colorimetric data of the test paint plate with a reference color, and color-determines whether the criterion of the toning end point is satisfied. When the color is not present in an acceptance range, the painter changes the painting condition to a painting condition that may come into the acceptance range and prepares a test paint plate again. To change painting conditions, the colorimetric data of the test paint plate is transmitted to the center server, and the information of a changed portion of painting conditions can be obtained from differences of L, a, and b values between the colorimetric data of the test paint plate and the reference color. When a color determination is accepted after repeating the above operation, it is possible to paint an actual automobile. After painting the actual automobile, the automobile is delivered to a repair painting requester.

[0068]

15 [Effect of the invention]

According to a toned-paint order-receiving and supplying method of the present invention, it is unnecessary for a repair painter to perform possession of primary-color paints, inventory control, and toning operations which have been performed by the repair painter so far, and it is possible to cut off toning operations and provide a quick cost-advantageous toned-paint order-giving and supplying method. Moreover, because the repair painter does not have to perform toning operations, it is unnecessary to secure an expert toning person, the inventory space of primary-color paints becomes empty, and therefore, this is advantageous from the viewpoint of legal restriction for safety.

25 [0069]

Moreover, according to the present invention method, a paint orderer (repair painter) can receive a toned paint from a toning person suitable for a purposed toning job out of a plurality of toning persons.

30 [Brief Description of Drawings]

[Fig. 1]

This is a schematic illustration showing a toned-paint order-giving and supplying method of the present invention.

[Fig. 2]

This is an illustration showing a flow of operations to be performed by a paint orderer in step (1).

[Fig. 3]

- 5            This is an illustration showing a flow of operations to be performed by an agent (center server) in steps (2).

[Fig. 4]

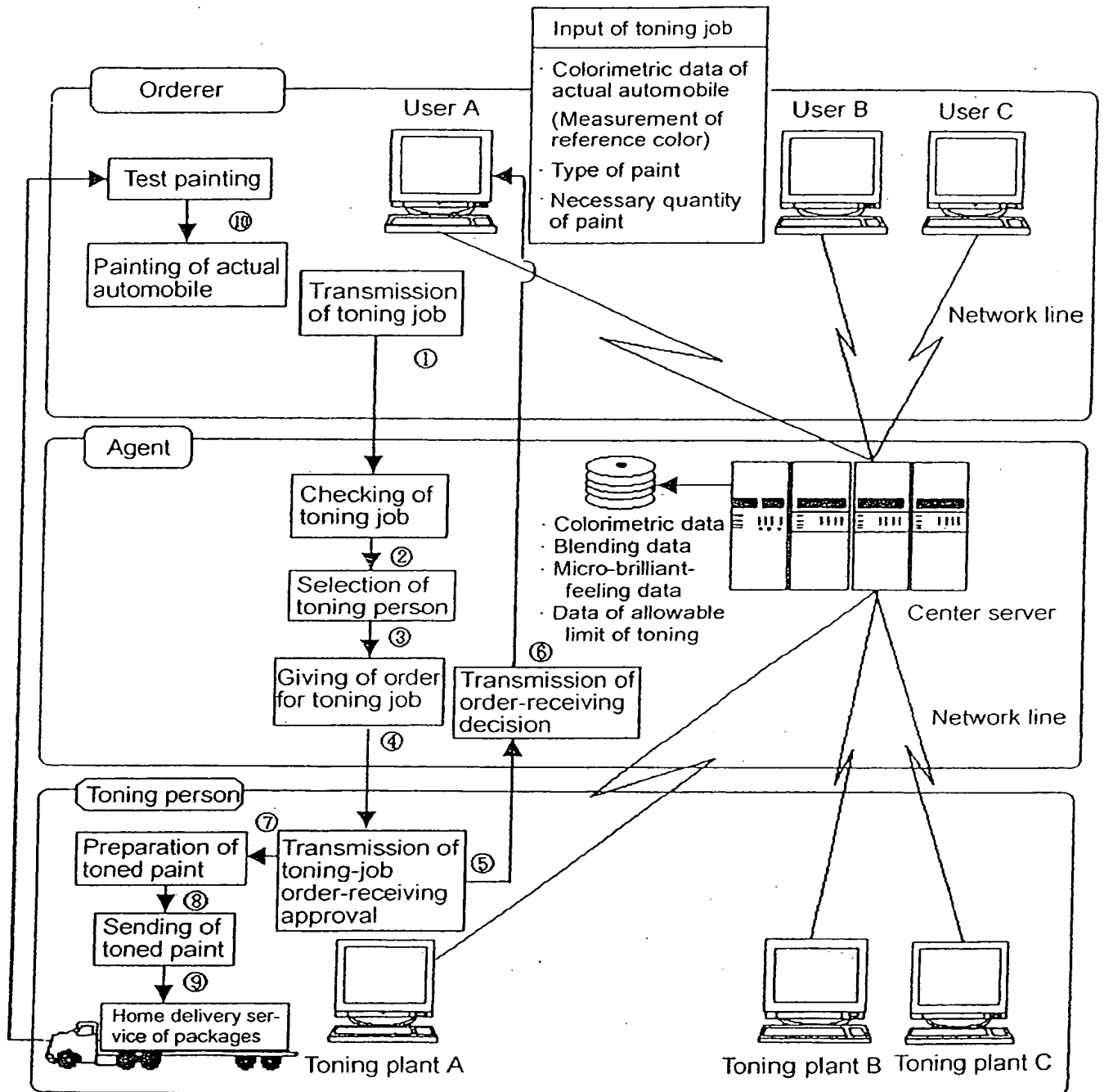
This is an illustration showing a flow of operations to be performed by a toning person approving the reception of an order for a toning job.

- 10   [Fig. 5]

This is an illustration showing a flow of operations to be performed by a painter when examining a toned paint supplied from a toning person.

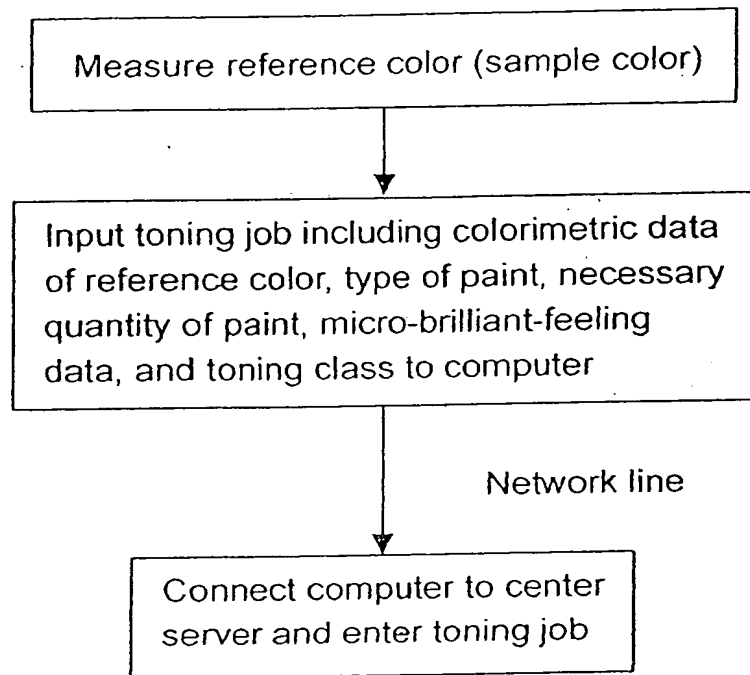
[Document Name] Drawings

[Fig. 1]



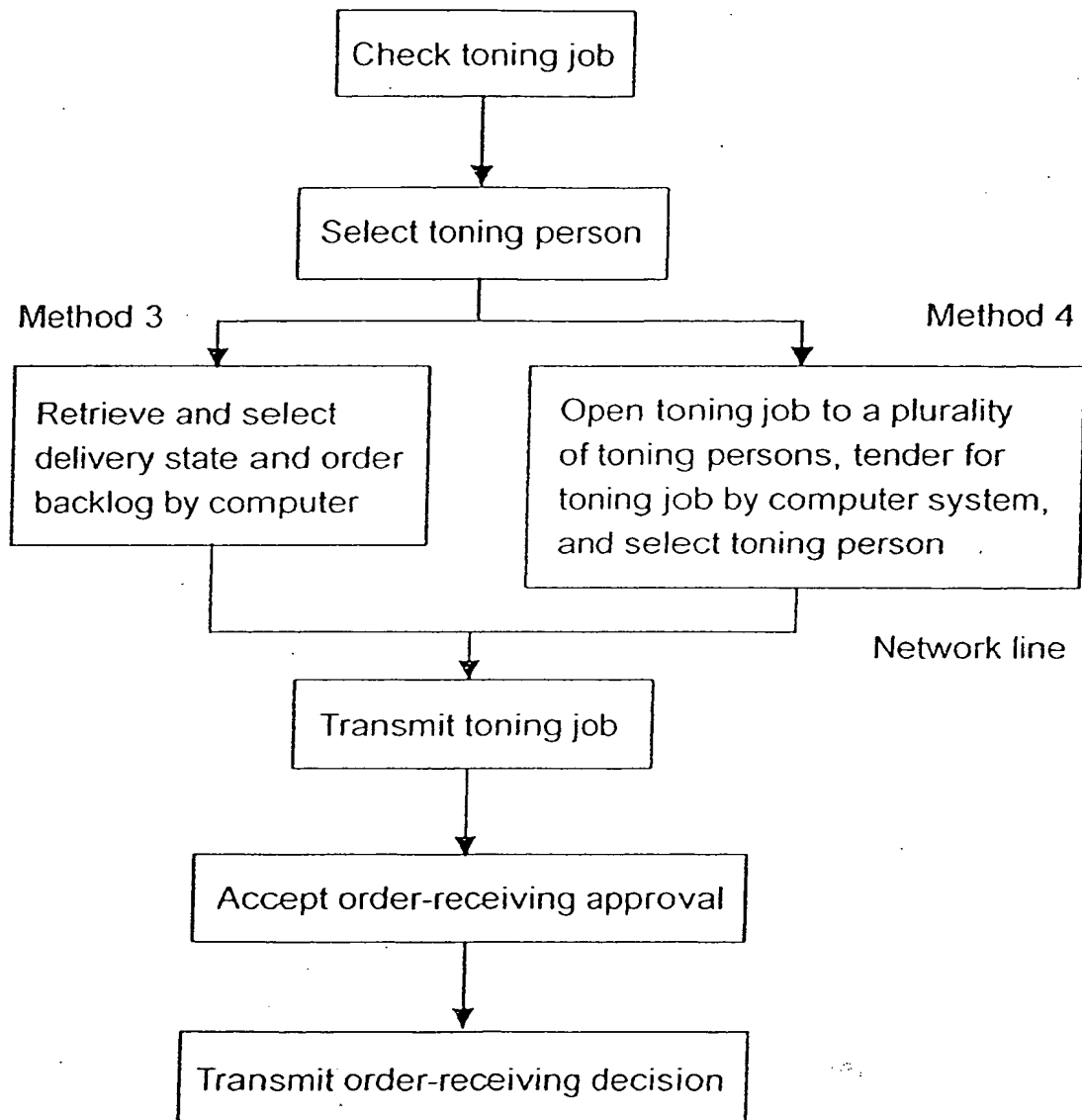
[Fig. 2]

## Operation flow 1 of paint orderer (User)



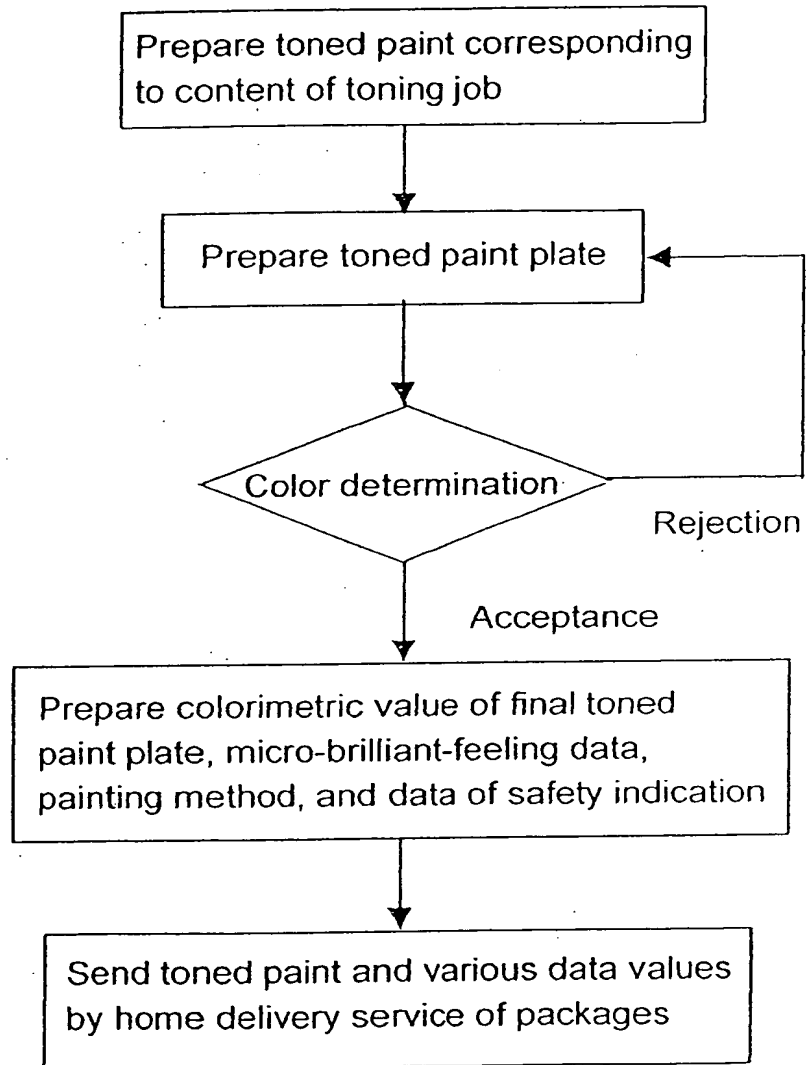
[Fig. 3]

## Operation flow of agent (Center server)



[Fig. 4]

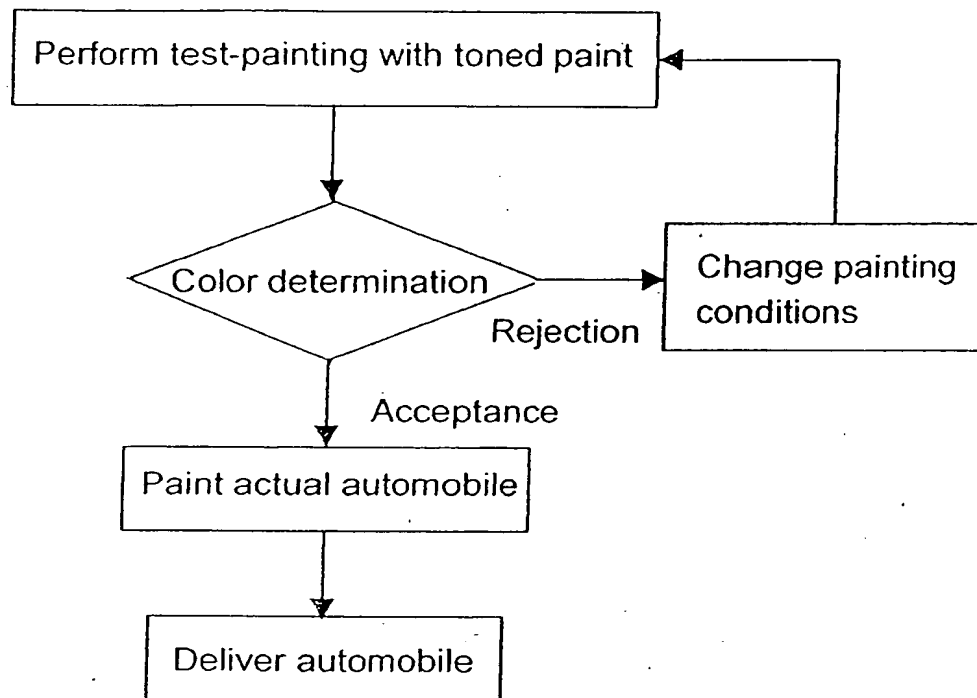
## Operation flow of toning person





[Fig. 5]

## Operation flow 2 of painter (User)



[Document Name] Abstract

[Abstract]

[Subject]

5       The present invention provides a quick and cost-advantageous  
toned-paint order-giving and supplying method capable of separating a toning  
operation from a repair-painting site, eliminating the toning operation from the  
painting site, separately obtaining a toned paint and providing the paint for  
painting.

[Means for Solution]

10       A toned-paint order-giving and supplying method characterized by  
including the following:

(1) a step of allowing a paint orderer to input the colorimetric data of  
a reference color with which the color of a paint should be matched through  
toning and the type and a necessary quantity of the paint to a computer terminal,  
15   to connect the computer terminal to a server computer of an agent, and to enter  
a toning job;

(2) a step of allowing the agent to select a toning person and to give  
an order for a toning job to the selected toning person;

(3) a step of allowing the agent to obtain an order-receiving approval  
20   from the toning person and to transmit an order-receiving decision to a  
computer terminal of the paint orderer;

(4) a step of allowing the toning person to prepare a toned paint  
corresponding to the content of the above toning job; and

(5) a step of supplying the above toned paint to the paint orderer.

25   [Selected Drawing]

Fig. 1